SCOPE OF SERVICES

(Title of Project)

Between the Louisiana Department of Environmental Quality
and the
(Cooperator)

Introduction

The Louisiana Department of Environmental Quality (LDEQ) completed the total maximum daily loads (TMDLs) for the Barataria Basin in 2003. The TMDL for Bayou Boeuf, Halpin Canal, Theriot Canal (020102) and Lake Boeuf (020103) indicated that in order to meet the water quality standard for dissolved oxygen, NPS pollutants need to be reduced by 100% in the summer months and 92% in the winter months. The model also indicated that natural background loads would need to be reduced by 37% during the summer months. The no-load scenario (i.e. no reductions in natural background loads) yielded minimum dissolved oxygen values of 3.5 mg/L for the summer months and 5.6 mg/L for winter months. The two predominant land use types in subsegment 020102 are wetland forests and agriculture, while the land use types in 020103 are mostly fresh marsh and open water.

It may not be possible to achieve the nonpoint source load reduction that the TMDL indicated would be necessary for subsegments 020102 and 020103 to meet their water quality standard for fish and wildlife propagation. The traditional approach for this problem would be to work with the sugarcane farmers to implement the types of best management practices that would reduce sediment, nutrients and organic material entering the water bodies. Since these watersheds exist within the same areas where coastal restoration projects are planned for diverting water from the Mississippi River to introduce more sediments and nutrients into the marshes and wetlands, all of these factors need to be considered when managing these types of watersheds.

This project proposes to provide information to assist the State in understanding how the nonpoint source goals and the coastal restoration goals will be met in waters impaired by nonpoint source pollutants. It may be beneficial for nonpoint source runoff from agricultural fields to be diverted into adjacent wetlands rather than into receiving water bodies. Doing so may improve wetland health while concurrently reducing impacts to receiving water bodies. Water quality modeling will provide data to show when and where nutrient reduction occurs, and thus supports the State's decision making by allowing many different management scenarios to be considered. Subsegments 020102 and 020103, referred to from here on as the 'Boeuf Basin', will be the pilot area to apply the watershed modeling and management tool that is applicable throughout the Coastal Restoration Area.

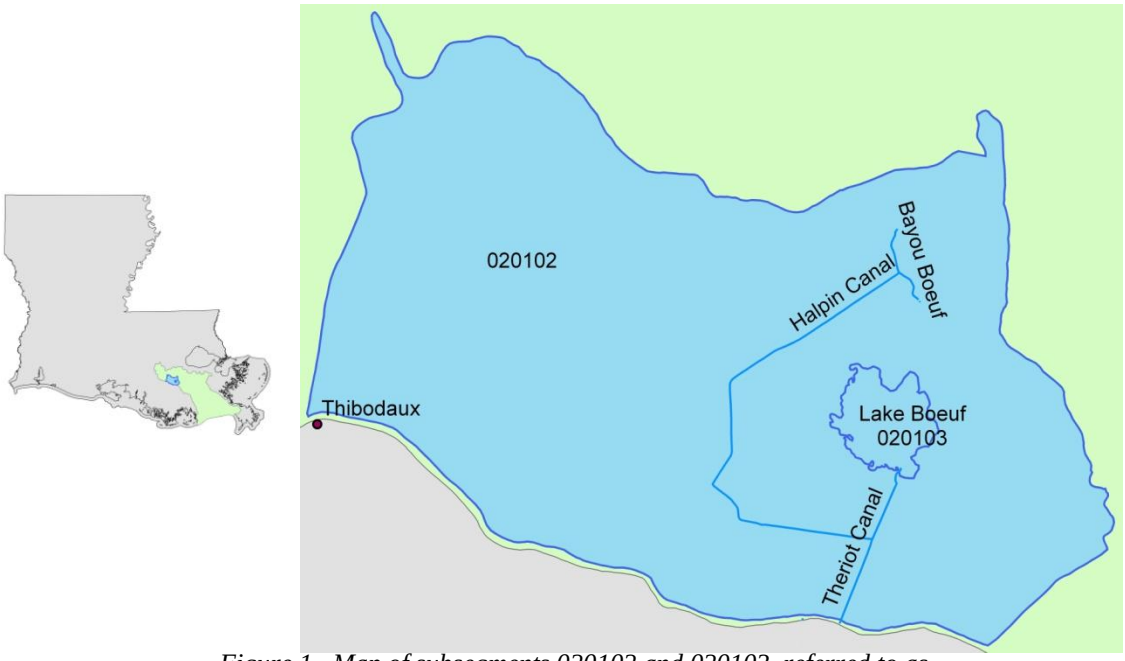

Figure 1. Map of subsegments 020102 and 020103, referred to as the 'Boeuf Basin', within the Barataria Basin.

Specific Goals and Objectives

The goal of this project is to develop a modeling program that will illustrate whether in-stream water quality standards can be met with and/or without the input of Mississippi River water into the Bayou Boeuf, Halpin Canal, Theriot Canal and Lake Boeuf. The outputs will also provide information on whether wetlands in the Barataria Basin will benefit from the introduction of nonpoint source loads from the sugarcane fields.

Specific objectives include:

1. Develop a website for sharing data and information about the Barataria Basin.
2. Develop strategies that will both restore wetlands and improve water quality.
3. Use a modeling program to demonstrate how using wetlands and water diverted from the Mississippi Rive can improve water quality in the Barataria Basin.

Monitoring Plan

LDEQ personnel will visit the project site at least once every quarter. The Department also will require the Principal Investigator to submit quarterly reports and also to compile annual reports for activities accomplished during these reporting quarters. DEQ will also communicate with PI via email and telephone.

Deliverables

The cooperator agrees to provide a link with access to the designed website, description of all scenarios, outline of the proposed and final modeling program, example of the map and table format that will be used to report the results, a copy of the proceedings of the workshops with abstracts and summaries of panel discussion, results of the validation and calibration of the various models, list of criteria and recommendations, hardcopy of notes/slides for any presentations given, list of minutes of group meetings, and other project contributions to LDEQ.

Program Element 1: Quality Assurance Project Plan Development

Task 1.1: QAPP Development

All work funded by this contract involving the acquisition of environmental data collected from other sources or compiled from computerized data bases and information systems shall be implemented in accordance with an approved Quality Assurance Project Plan (QAPP). The QAPP will be developed using a systematic planning process. It will document a concise and complete plan for the environmental data operation and its quality objectives and will identify key project personnel. Any costs for data generation or environmental measurements incurred prior to approval of the original QAPP will be ineligible for reimbursement under this contract.

The QAPP will describe the project management and the collection, analysis, evaluation, and reporting of all data collected during the project. The document will be developed according to EPA requirements for QAPPs (EPA QA/R-5) and guidance for QAPPs (EPA QA/G-5) and will address each element of the project. EPA QA/R-5 and QA/G-5 can be found at: http://www.epa.gov/quality/qa_docs.html#EPArqts.

The contractor is responsible for maintaining an electronic version of the QAPP in Microsoft (MS) Word.

None of the environmental work addressed by the QAPP or any other work associated with this contract shall be started until the QAPP has been approved and distributed to project personnel.

The contractor shall ensure that the QAPP is implemented and that all personnel involved in the work have direct access to and understanding of the QAPP and all other necessary planning, implementation, and assessment documents. These personnel should understand the requirements prior to the start of data generation activities.

Equipment Purchases:

Equipment funded through this contract may not be purchased before approval of the QAPP and/or without prior express written approval from LDEQ.

QAPP Reviews and Revisions: The contractor shall, at a minimum, conduct annual reviews of the QAPP and revise as needed (more frequent review and revision may be necessary). The contractor is responsible for initiating the annual review of the QAPP prior to the expiration date. The expiration date is one year after the latest date of an EPA signature.

Sixty (60) days prior to the expiration of the QAPP the contractor will submit to LDEQ a new signature page with current dates if the annual review reveals that a revision is not needed. Results of the review shall be documented on the Review and Revision Record of the QAPP.

Ninety (90) days prior to the expiration of the QAPP the contractor will submit to LDEQ a draft revised QAPP if the annual review reveals that a revision is needed. Results of the review and all proposed revisions shall be documented on the Review and Revision Record of the QAPP.

Deliverable:
Approvable QAPP and subsequent reviews.

Federal Cost	Schedule/Due Date
$0.00	***Months XX-XX***

<u>Program Element 2:</u> Identifying conflicts and common strategies for wetland restoration and water quality improvement

Work with Barataria-Terrebonne National Estuary Program (BTNEP) and LDEQ to establish an interagency working group that will work with the science team and policy-makers to develop win-win hydrologic modifications that either separately or as part of larger restoration projects should improve the quality of open waters while delivering more sediment and nutrients to wetlands that need them.

<u>Task 2.1:</u> Interagency working group
Assist the BTNEP and LDEQ in establishing an interagency working group that will meet quarterly with the science team and policy-makers to discuss topics including hydrologic modifications to the basin to improve water quality (Task 2.4), development of a modeling program with different diversion scenarios (Task 3.1), location of water quality sampling sites (Task 3.3), and strategic implementation of BMPs.

Deliverable:
List of people in the working group.
List of minutes of quarterly working group meetings, including relevant communications and recommendations.

Federal Cost	Schedule/Due Date
$0.00	***Months XX-XX***

Task 2.2: Web page
Establish and maintain a web portal for sharing data and other information between the agencies, universities and other entities working on projects within the Barataria Basin.

Deliverable:
The address of the website

Federal Cost	Schedule/Due Date
$0.00	***Months XX-XX***

Task 2.3: Workshops
Assist the BTNEP and LDEQ in organizing three one-day workshops for the broader public and policy-makers. Topics of discussion will be current land practices, implementation of BMPs, and possible diversion scenarios and hydrologic modifications to the basin. The proceedings (with abstracts and summaries) of the three workshops will be posted on the website.

Deliverable:
A copy of the proceedings of the three workshops with abstracts and summaries of panel discussion, which will also be in the Annual Reports.

Federal Cost	Schedule/Due Date
$0.00	***Months XX-XX***

Task 2.4: Hydrologic modifications
Develop conceptual plans for hydrologic modifications that either separately, or as part of larger restoration projects, are expected to improve water quality of open waters while delivering more sediment and nutrients to deteriorating wetlands. A preliminary proposal will be presented to the working group.

Deliverable:
A copy of the preliminary proposal and final proposal of conceptual plans for hydrologic modification.

Federal Cost	Schedule/Due Date
$0.00	***Months XX-XX***

Task 2.5: Identify past data sets and natural history of the basin
An extensive literature review of historical and current ecological indicators of ecological health and water quality of the Boeuf Basin will be carried out.

Deliverable:
Literature references and data files submitted to LDEQ for review.

Federal Cost	Schedule/Due Date
$0.00	***Months XX-XX***

Program Element 3: Modeling water quality improvement through use of wetlands to remove nutrients, and river water to reduce residence time

Task 3.1: Outline modeling program
Outline a modeling program including (1) one- and two-dimensional models for scenarios based on the concepts developed in Tasks 2.1, 2.3 and 2.4, and (2) a no action scenario in which hydrologic modifications are not made. A team of six PhDs from the School of the Coast and Environment at LSU will choose sites where NPS runoff enters canals and water bodies directly and where runoff enters wetlands. This group will work specifically to link to an ongoing 319 project on runoff from sugarcane field. Consult with BTNEP working group and LDEQ to develop a standard map and tabular format for reporting model output and statistical estimates of uncertainty common to all models.

Deliverable:
Description of scenarios, with maps depicting the locations of the chosen sites.
Outline of the proposed and final modeling program.
Example of the map and table format that will be used to report the results.

Federal Cost	Schedule/Due Date
$0.00	***Months XX-XX***

Task 3.2: Hydrologic bathymetric survey
Conduct a hydrological bathymetric survey to determine hydrology in the Boeuf Basin. Most unforested areas in the experimental watershed consist of floating marsh, locally called 'floatant.' Up to 1.5 m of water flows under the marsh root mat under normal conditions, but this varies with the type (buoyancy) of the marsh and the time of year. These areas must be surveyed primarily from an air boat. The survey team will set up traverses with stops at regular intervals. The team will ascertain at each stop, the type of vegetation present, and the thickness of the mat, the thickness of the water column, and the direction and magnitude of flow. We will use standard hydrographic survey methods (integrated DGPS with echo sounder) to fill in information gaps about channel dimensions. The survey will be conducted to the resolution and accuracy necessary to meet modeling needs.

Deliverable:
Results of the hydrological bathymetric survey.

Federal Cost	Schedule/Due Date
$0.00	***Months XX-XX***

<u>Task 3.3:</u> Water quality sampling
Carry out quarterly event-based water quality sampling for two years at 8-12 sites in selected field areas (Task 2.1) to extend results from other ongoing or recently completed projects (TMDLs, UAAs, other 319 projects) and otherwise support calibration and validation of processes incorporated in models. Initiate survey and water quality sampling program to meet identified information gaps, scenario concepts identified in Tasks 2.1, 2.3 and 2.5, and model needs identified in Task 3.1.

Deliverable:
Results of the water quality data.

Federal Cost	Schedule/Due Date
$0.00	***Months XX-XX***

<u>Task 3.4:</u> Water quality modeling
Set-up, calibrate, and validate numerical water quality models outlined in Task 3.1, progressing from the one-dimensional TMDL models to two-dimensional estuarine models. Run selected scenarios interactively with interagency working group.

Deliverable:
Results of the validation and calibration of the one-dimensional models and results of running the one-dimensional scenarios in the format of a map and table decided upon in Task 3.1.
Results of the validation and calibration of the two-dimensional models and results of running the two-dimensional scenarios in the format of a map and table decided upon in Task 3.1.

Federal Cost	Schedule/Due Date
$0.00	***Months XX-XX***

Program Element 4: Communicating results and recommendations for NPS controls

Task 4.1: Results and recommendations
Assist the LDEQ in developing site-specific criteria and recommendations for optimizing the use of natural wetlands to treat nonpoint source pollution as a restoration goal. Give presentations at LDEQ venues as requested. Participate in planning and training groups in addition to the BTNEP and provide any additional reporting requested.

Deliverable:
List of criteria and recommendations that are developed with LDEQ.
Hardcopy of notes/slides for any presentations given at LDEQ venues.
List of minutes of other group meetings.

Federal Cost	Schedule/Due Date
$0.00	***Months XX-XX***

Program Element 5: Quarterly Reports, Annual Reports and Final Report

Cooperator will communicate with LDEQ on all aspects of the project during the course of the contract term. Quarterly reports, annual reports, invoices and deliverables are to be submitted in a timely manner.

Task 5.1: Quarterly Reports
Quarterly monitoring reports which include narrative documentation of all project activities and results will be submitted to LDEQ. Accompanying deliverables, as required by individual tasks upon their completion, shall accompany monitoring reports. Comprehensive analysis and interpretation of project results will be included in the monitoring reports as available. Invoices must also accompany these monitoring reports.

Deliverable:
Monitoring reports, with attached deliverables, which detail progress to date will be submitted throughout the duration of the project and will specify any problems or issues encountered during the course of the project.

Federal Cost	Schedule/Due Date
$0.00	***See below***

Schedule: Draft monitoring reports are due the 10th of the month following each calendar quarter (Jan. 10th, Apr. 10th, Jul. 10th, and Oct. 10th) for all quarters until the final report is submitted to EPA or the contract term period expires. Draft monitoring reports can be submitted via electronic submission. Acceptable forms of electronic submission are MS

Word or MS Excel accompanied by a PDF version of that quarterly report. Electronic submittal templates will be provided by the LDEQ project officer.

In addition, final monitoring reports including an invoice/request for payment are due via hard copy by the 30th of each month following each calendar quarter (Jan. 30th, Apr. 30th, Jul. 30th, and Oct. 30th) for all quarters until the final report is submitted to EPA or the contract term period expires.

Task 5.2: Annual Reports

An annual report will be submitted to LDEQ documenting all project activities during the corresponding federal fiscal year (Oct.1 – Sept. 30). These reports will show the results achieved and the impact of BMPs on water quality. Previously submitted deliverables may be referenced rather than included in the annual report. In addition, cooperator is required to present the progression of their project at the LDEQ in Baton Rouge during the Section 319 annual project review session in November.

Deliverable:

Annual reports will document the results of project accomplishments during that federal fiscal year. The annual report to LDEQ should be an analysis of results, as applicable, rather than a description of activities, and cooperator will make a presentation to the LDEQ on project progress/status in November.

Federal Cost	Schedule/Due Date
$0.00	***See below***

Schedule: **(1)** Annual reports are due by October 30th following the end of the reporting period. **(2)** Section 319 Project Review Session - Beginning second (2nd) Wednesday and Thursday of November, 2008, and each second (2nd) Wednesday and Thursday of November thereafter until the final report is submitted to EPA.

Task 5.3: Final Report

Develop and submit a final report draft that provides a detailed account of all the activities and results of the project including any related documents, illustrations and visual presentation material including a summary table that lists all services performed on behalf of this project. All supporting photographs and finished deliverables etc. shall be resubmitted and thoroughly explained in the final report.

Upon incorporation of LDEQ revisions to the final report draft, triplicate copies of the Final Project Report and all deliverables shall be submitted to LDEQ.

Deliverable: Final Report.

Federal Cost	Schedule/Due Date
$0.00	***Months XX-XX***

Schedule:
The final report is due and must be submitted within 60 days before the contract end date. Failure to meet this requirement can result in deduction of funds for incompletion of task during contract term period.

Final report addressing all comments, concerns, and revisions must be approved by LDEQ and EPA before this task can be considered complete and final payment of federal funds can be paid to the cooperator.

***NOTE: Fifteen Percent (15%) of the federal share will be retained until the final report is completed, and has been accepted by DEQ and EPA. For the first 11 invoices, $X.XX will be withheld to ensure that the 15% required retainage ($X.XX) is remaining until the end of the project.**

Schedule and Cost by Task

Task	Description	Federal	Match	Total	Schedule
1.1	QAPP Development	$0.00	$0.00	$0.00	Months XX-XX
2.1	Interagency working group	$0.00	$0.00	$0.00	Months XX-XX
2.2	Web page	$0.00	$0.00	$0.00	Months XX-XX
2.3	Workshops	$0.00	$0.00	$0.00	Months XX-XX
2.4	Hydrologic modifications	$0.00	$0.00	$0.00	Months XX-XX
2.5	Past data sets and basin history review	$0.00	$0.00	$0.00	Months XX-XX
3.1	Outline modeling program	$0.00	$0.00	$0.00	Months XX-XX
3.2	Hydrologic bathymetric survey	$0.00	$0.00	$0.00	Months XX-XX
3.3	Water quality sampling	$0.00	$0.00	$0.00	Months XX-XX
3.4	Water quality modeling	$0.00	$0.00	$0.00	Months XX-XX
4.1	Results and recommendations	$0.00	$0.00	$0.00	Months XX-XX
5.1	Quarterly Reports	$0.00	$0.00	$0.00	Jan. 10th, Apr. 10th, Jul. 10th, and Oct. 10th
5.2	Annual Reports	$0.00	$0.00	$0.00	Oct. 30/year
5.3	Final Report	$0.00	$0.00	$0.00	Months XX-XX
	Total	$0.00	$0.00	$0.00	

Budget by Category

Category	Year 1	Year 2	Year 3	Total RequestedFunds	Match	Total Budget
Personnel	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
Staff						
Staff	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
Staff	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
Staff	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
Staff	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
Staff	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
Research Associate	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
Salary Subtotal	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
Undergrad Student	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
Fringe Benefits	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
Total Personnel	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
Total Operating Services: Travel Supplies Other Costs	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
Subtotal	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
Indirect Costs (23%; 47% match)	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
Unrecovered Indirect (47%-23% = 24%)	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
Total	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00

BUDGET JUSTIFICATION

A. Salary and Wages:

(Description)

Federal: $0.00 Match: $0.00 Total: $0.00

B. Equipment:

(Description)

Federal: $0.00 Match: $0.00 Total: $0.00

C. Supplies & Operation Services:

Travel: (Description)

Supplies: (Description)

Other Direct Costs: (Description)

Federal: $0.00 Match: $0.00 Total: $0.00

D. Indirect costs:

(Description)

Federal: $0.00 Match: $0.00 Total: $0.00

E. Match:

(Description)

Match Total: $0.00